SAF-RC-232 100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

No Distribution Required

KW 10/27/15 INITIAL/DATE

COMMENTS:

SDG JP1000 SAF-RC-232

Sample Location: 600-326 Date:

19 August 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-326

Subject:

Inorganic - Data Package No. JP1000-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1000 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V846	10/1/15	Soil	С	See note 1
J1V847	10/1/15	Soil	С	See note 1
J1V848	10/1/15	Soil	С	See note 1
J1V849	10/1/15	Soil	С	See note 1

^{1 -} ICP metals (6010B).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

· Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

· Preparation (Method) Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the calcium, chromium, magnesium, zinc and nickel results in sample J1V849 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1V849) was submitted for analysis. Nine analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

· Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (52%) and silicon (16%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (19%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

· Precision

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1V846/J1V848) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data package No. JP1000 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the calcium, chromium, nickel, zinc and magnesium results in sample J1V849 were qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (52%) and silicon (16%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (19%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2 Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP1000	REVIEWER: ELR	Project: 600-326	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Chromium Magnesium Nickel Zinc	UJ	J1V849	Method blank contamination
Silicon	J	All	LCS recovery
Antimony Silicon	J	All	MS recovery

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V846

Client: Washington Closure Hanford

Lab Sample ID:

280-74906-1

Client Matrix:

Solid

% Moisture:

Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

6010B Metals (ICP)

Analysis Method:

6010B

Analysis Batch: 280-298187

Instrument ID:

MT_025

Prep Method:

3050B 1.0

Prep Batch:

280-297784

Lab File ID: Initial Weight/Volume: 1.119 g

25B100615.asc

Dilution: Analysis Date: Prep Date:

10/06/2015 1850 10/05/2015 1350 Molalig

Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL	
Antimony	THE R. P. LEWIS CO., LAND WINDS AND RESERVED THE PROPERTY OF T	0.38	L U	0.38	0.59	
Arsenic		3.5		0.65	0.99	
Barium		80.8		0.075	0.49	
Beryllium		0.28		0.033	0.20	
Boron		1.2	В	0.97	2.0	
Cadmium		0.14	В	0.041	0.20	
Calcium	•	3570		13.9	49.5	
Chromium		9.4		0.057	0.20	
		8.1		0.099	0.99	
Cobalt		11.3		0.21	0.99	
Copper		6.0		0.27	0.49	
Lead		4260		3.7	19.8	
Magnesium		307		0.099	0.99	
Manganese		0.26	U	0.26	2.0	
Molybdenum		9.8	ŭ	0.12	4.0	
Nickel	•	1700		40.6	297	
Potassium		0.85	U	0.85	0.99	
Selenium		325	йJ	5.6	9.9	
Silicon			Ü	0.16	0.20	
Silver		0.16	U	58.4	119	
Sodium		192		0.093	2.0	
Vanadium		51.9		0.093	 .0	

Analysis Method: Prep Method:

6010B 3050B 1.0

Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID: Lab File ID:

MT_025 25A100715.asc

Initial Weight/Volume: Final Weight/Volume: 1.119 g 100 mL

Dilution: Analysis Date:

10/07/2015 1602

Prep Date:	10/05/2015 1350
A 1: -t-	Double Cor

Analyte	DrvWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum	TO SERVICE A CONTRACTOR OF THE PROPERTY OF THE	7590	Chamber design on the partiest space of the community of	1.5	4.9
		20700	Χ	3.8	4.9
Iron		41.8	X	0.39	0.99
Zinc		41.0	^	****	

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID: J1V847

Client: Washington Closure Hanford

Lab Sample ID:

280-74906-2

Client Matrix:

Solid

% Moisture:

11.5

Date Sampled: 10/01/2015 0720

Date Received: 10/02/2015 0935

6010B Metals (ICP)

Analysis Method: 6010B Prep Method:

Analysis Date:

Dilution:

Prep Date:

3050B

1.0

10/06/2015 1900 10/05/2015 1350 Analysis Batch: 280-298187 Prep Batch:

Miolislis

280-297784

Instrument ID: Lab File ID:

MT_025 25B100615.asc

Initial Weight/Volume: 1.101 g Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL 、
Antimony	er sen er ververe stædere en er en	0.39	U)	0.39	0.62
Arsenic		6.0		0.68	1.0
Barium	·	113		0.078	0.51
Beryllium		0.32		0.034	0.21
Boron		1.3	В ~	1.0	2.1
Cadmium .	·	0.35		0.042	0.21
Calcium	•	5750		14.5	51.3
Chromium		19.1		0.060	0.21
Cobalt		7.8		0.10	1.0
Copper		20.2		0.22	1.0
Lead		12.0		0.28	0.51
Magnesium		5260		3.8	20.5
Manganese		321		0.10	1.0
Molybdenum		0.27	U	0.27	2.1
Nickel		15.5		0.13	4.1
Potassium		1770		42.1	308
Selenium		0.88	U	0.88	1.0
Silicon		328	I	5.8	10.3
Silver		0.16	U	0.16	0.21
Sodium		410	-	60.6	123
Vanadium		46.9		0.096	2.1

Analysis Method: Prep Method:

Analysis Date:

Dilution:

Zinc

6010B 3050B

1.0

10/07/2015 1612 10/05/2015 1350 Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID:

MT_025 25A100715.asc

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

1.101 g 100 mL

> RL 5.1 5.1

> 1.0

Prep Date:	10/05/2015 1350			
Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL
Aluminum	ia publicador (17 de 1974 de 1975), inflicações de destador dos la compositión de tros de destador do destador de 1986 de 1987 de 1997	10600	A CONTRACTOR OF THE PARTY OF TH	1.6
Iron		21600	Χ	3.9
Zinc		74.6	Х	0.41

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V848

Lab Sample ID:

280-74906-3

Client Matrix:

Solid

% Moisture:

Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

6010B Metals (ICP)

Analysis Method:

6010B 3050B Analysis Batch: 280-298187 Prep Batch:

280-297784

Instrument ID: Lab File ID:

MT_025 25B100615.asc

Prep Method: Dilution: 1.0

Analysis Date: Prep Date:

10/06/2015 1903 10/05/2015 1350 W10/17/13

Initial Weight/Volume:

1.055 g

Final Weight/Volume:

100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.39	U3	0.39	0.62
Arsenic		3.4		0.68	1.0
Barium		81.8		0.079	0.52
Beryllium		0.28		0.034	0.21
Boron		1.3	В	1.0	2.1
Cadmium		0.10	В	0.042	0.21
Calcium		3570		14.6	51.8
Chromium		8.9		0.060	0.21
Cobalt		9.2		0.10	1.0
Copper		10.8		0.22	1.0
Lead		5.3		0.28	0.52
Magnesium		4160		3.8	20.7
Manganese		154		0.10	1.0
Molybdenum		0.27	U	0.27	2.1
Nickel		9.5		0.13	4.1
Potassium		1720		42.5	311
Selenium		0.89	U	0.89	1.0
Silicon		338	T	5.9	10.4
Silver		0.17	U	0.17	0.21
Sodium		194	-	61.1	124
Vanadium		49.7		0.097	2.1

Analysis Method:

6010B Prep Method:

3050B 1.0

Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID:

MT_025 25A100715.asc

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

1.055 g 100 mL

Analysis Date:

Dilution:

10/07/2015 1614

Prep Date:	10/05/2015 1350
Amalista	Double Con

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7620		1.6	5.2
Iron		20200	X	3.9	5.2 1.0
Zinc		42.1	Χ .	0.41	1.0

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V849

Client: Washington Closure Hanford

Lab Sample ID:

280-74906-4

Client Matrix:

Solid

0.0 % Moisture:

Date Sampled: 10/01/2015 0743 Date Received: 10/02/2015 0935

6010B Metals (ICP)

Analysis Method: Prep Method:

3050B

6010B

1.0 10/06/2015 1905

Analysis Date: Prep Date:

Dilution:

10/05/2015 1350

Analysis Batch: 280-298187 Prep Batch:

280-297784

1/10/17/15

Instrument ID:

MT_025

Lab File ID: Initial Weight/Volume: 1.129 g

25B100615.asc

Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL	
	S.C. Name (18) - N.C. News Leaves and Herrich St. Helm School and Anthonic and Anthonic Annies Annies (18) and Anthonic and Anthonic Annies Annies (18) and An	0.34	U J	0.34	0.53	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Antimony		0.58	υ	0.58	0.89	
Arsenic		1.3	-	0.067	0.44	
Barium		0.029	Ú	0.029	0.18	
Beryllium			Ü	0.87	1.8	
Boron		0.87	Ü	0.036	0.18	
Cadmium		0.036	BCUT	12.5	44.3	
Calcium		38.3		0.051	0.18	
Chromium		0.16	BQJ		0.89	
Cobalt		0.089	U	0.089	0.89	
Copper	•	0.26	В	0.19	0.44	
Lead		0.27	В	0.24		
Magnesium		18.9	CUJ	3.3	17.7	
Manganese		3.0		0.089	0.89	
		0.23	U	0.23	1.8	
Molybdenum		0.17	вс∪∫	0.11	3.5	
Nickel		36.3	.U	36.3	266	
Potassium		0.76	U	0.76	0.89	
Selenium		91.5	Ī	5.0	8.9	
Silicon		0.14	Ú	0.14	0.18	
Silver			Ŭ	52.3	106	
Sodium		52.3	B	0.083	1.8	
Vanadium		0.25	Ð	0.000	· · · ·	

Analysis Method:

6010B Prep Method: 3050B

Dilution: Analysis Date: 1.0

Prep Date:

10/07/2015 1617 10/05/2015 1350 Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID:

MT_025 25A100715.asc

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

1.129 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Special engine Contraction of the Contraction of th	THE REPORT OF THE PROPERTY OF	112	oekir (K. Michael XII beredijsec (Auth.) (Mili Judi Judeen No.) ("Alabest Jerseypes)	1.4	4.4
Aluminum		171	Χ	3.4	4.4
iron		1.3	CX OJ	0.35	0.89
Zinc		1.5	~		

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-74906-1

SDG #: JP1000 SAF#: RC-232

Date SDG Closed: October 2, 2015 Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u> J1V846 J1V847 J1V848	LAB ID 280-74906-1 280-74906-2 280-74906-3	ANALYSES REQUESTED 6010/9056M/8310/8081 6010/9056M/8310/8081 6010/9056M/8310/8081	ANALYSES PERFORMED 6010B/9056M/8310/8081A 6010B/9056M/8310/8081A 6010B/9056M/8310/8081A 6010B
J1V849	280-74906-4	6010	60 10B

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 10/2/2015 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

GC SEMIVOLATILES - SW846 8081A - Pesticides

The organic prep laboratory noted that the samples presented in this report required a Florisil clean-up to reduce matrix interferences.

The laboratory noted that the samples presented in this report required a mercury clean-up to reduce matrix interferences caused by

The RPD between the primary and confirmation columns exceeded 40% for 4,4'-DDE in sample J1V847. The higher of the two values has been reported. The result has been flagged with a "Y".

The MS/MSD performed on sample J1V846 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limit was exceeded for 4,4'-DDD and 4,4'-DDE. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene and Phenanthrene in sample J1V847. The lower of the two values has been reported, as matrix interference is evident on both columns. The results have been flagged with an "X".

The MS/MSD performed on sample J1V847 exhibited percent recoveries outside the control limits for Chrysene, and the associated sample result has been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Continuing Calibration Verification (CCV) standards associated with samples in analysis batch 280-298048 exhibited %Difference (%D) values >15%, biased high, for Benzo[g,h,i]perylene, Dibenzo[a,h]anthracene and Fluoranthene. The samples associated with these CCVs are either non-detect or less than the reporting limit; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-297784 indicates that physical and chemical interferences are present for Iron and Zinc. Results have been flagged with an "X".

Low levels of Barium, Calcium, Chromium, Magnesium and Nickel are present in the method blank associated with batch 280-297784. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Zinc is present in the method blank associated with batch 280-297784 at 0.797 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 1 mg/kg. TestAmerica's practical quantitation limit (PQL) for Zinc is 3 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1V849, the associated sample amounts are greater than twenty times the method blank concentration.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-297784. As the associated sample amounts are greater than twenty times the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V846; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V846, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, the Sulfate analysis of sample J1V847 had to be performed at a dilution, and the associated result has been flagged with a "D". The reporting limit has been adjusted relative to the dilution required.

Sulfate is present in the method blank associated with batch 280-297863 at 7.21 mg/kg, which is greater than the project specific reporting limit (PSRL) of 5 mg/kg. TestAmerica's practical quantitation limit (PQL) for Sulfate is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL.

The Matrix Spike performed on sample J1V846 exhibited the percent recovery outside the control limits for Fluoride, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Cl	osure Hanf	ord CHA	IN OF CUST	ODY/S	AMPL	LE ANA	L1919	REGUE	91	RC-232		Data Tun	namund
Hactor		Compan	y Contact		phone No. -4688		Pr	oject Coordinato KESSNER, JH		rice Code		Down 1 Dr.	
CRAIG, JC			Kessner g Location		1.000		SI	VF No.		8 J	3	700	4.0
oject Designation 100-IU-2 & 100-IU-6 Remai	ning Waste Sites		326 (Areas 1 and 2) ver	ification				RC-232		0.	<u> </u>	1 44	-
Chart No.			gbook No.		COA	2000	M	ethod of Shipmer Commercial C	arrier \	S 6-2	·×		
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ipped To		Offsite I	Property No. A131	443				500 0	SPC				
TestAmerica Denver			,,,,,,	1	T	T				110001.00	MANDER MI	ACCE AND ALL DE	I
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1 A TRE 10-1-15			Preservation		<u> </u>								
			Type of Container	G/P	aG	aG	G/P			200.74906	Chain of Cu	istody	184
			No. of Container(s)	1	1	1	1			200-14000	Of Idan of the		
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one			Volume	250mL	250mL	250mL	250ml.						
	*				1								
اسمالمست سيناداني ويرورو	Storage			See item (1)	1		See item (2)	in					
pecial Handling and/or	Storage		Sample Analysis	Special Instructions	PAHs - 83	Pesticides - 8081	See item (2) Special Instructions	. 1				1 1	
ooling as required				- SERVICE			1	1					
ס		·	e Sample Time	EXTERNAL CONTRACTOR	STATE STATE	· · · · · · · · · · · · · · · · · · ·	E STAN	P PUREH		2000年1月2日	100	********	學的
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J R /847	SOIL	10/01/15	0720	X	<u> </u>	X	1×						
J \ ₹848	SOIL	10/01/19	5 0755	X	×	X	$\perp \times$	1			 	 	
J1V849	SOIL	roloili	5 0743	X				1				-	
310049				. ,							<u></u>	1	<u> </u>
	COECCION	<u> </u>	Sign/Print Names			ECIAL INSTR	UCTIONS				Dedum Por	diam Room (Cadmium
CHAIN OF PO	Deta/Time 680	Received By/Sto	red in Date/Tim	0000 e		Jalaisa Chromi	wn Cohalt	se-out List) (Alum Copper, Iron, Lea	O. MEGHIN	armony, Arsenic Esium, Mangané	se, Molybder	um, Nickel, Po	tassium,
Wine CERISE	" Long 10/1	الما ما	nez/c-max	<u>مع رما</u>	11111	Selenium, Silicon	, Silver, So	ikum, Vanadium, 2 I (Bromide, Chlori	Zinc} de Pluor	ide. Nitrogen in	Nitrate, Nitro	gen in Nitrite, Pl	hosphoror
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FINAL SAMPLE Disposal L													

Appendix 5 Data Validation Supporting Documentation

<u>V</u> ALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: 6	00-326		DATA PACKAG	e: JP100	10
VALIDATOR:	ELR	LAB: TAC		DATE: 10	15/15
			SDG:	P1000	
		ANALYSES 1	PERFORMED		
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MAT	RIX				
JIV84C	11084	7 JIV	848 11	U 849	
					56,(
			C. CD MADDATES	703	
	ACKAGE COMPI				Yes No N/A
	ion documentation				100 100 1071
Comments:					
			-		
2. INSTRU	MENT PERFORM	MANCE AND CA	LIBRATIONS (Le	vels D and E)	$\langle c \rangle$
Initial calibrations	performed on all in	struments?		•••••	Yes No N/A
Initial calibrations	acceptable?				Yes No N/A
ICP interference c	hecks acceptable?				Yes No N/A
ICV and CCV che	cks performed on a	Il instruments?			Yes No N/A
ICV and CCV che	cks acceptable?		•••••		Yes No N/A
Standards traceabl	le?				Yes No N/A
Standards expired	?		***************************************		Yes No N/A
					Yes No N/A

BLANKS (Levels B, C, D, and E)	
CB and CCB checks performed for all applicable analyses? (Levels D, E)	Yes No NA
CB and CCB results acceptable? (Levels D, E)	Yes No (N/A
Laboratory blanks analyzed?	(.Yes) No N/A
Laboratory blank results acceptable?	Yes No V/A
Field blanks analyzed? (Levels C, D, E)	(Yes) No N/A
Field blank results acceptable? (Levels C, D, E)	Yes (No) N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A
Comments: Us. Calcum, chramum, magn	osim Nickel - U.P
4. ACCURACY (Levels C, D, and E)	
MS/MSD samples analyzed?	Yes No N/A
MS/MSD results acceptable?	Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A
MS/MSD standards expired? (Levels D, E)	Yes No NA
LCS/BSS samples analyzed?	Yes No N/A
LCS/BSS results acceptable?	Yes No NA
Standards traceable? (Levels D, E)	Yes No N/
Standards expired? (Levels D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A
Performance audit sample(s) analyzed?	Yes(No) N/A
Performance audit sample results acceptable?	Yes No (N/A
Comments: LC3 - Silican (1970) -)	
Comments: LC3 - Silican (1970) - J MS- antmy (5270) Tilican (1670) -	- I all
	NO PAS

5.	PRECISION (Levels C, D, and E)	
Duplio	cate RPD values acceptable?	(.ýes) No N/A
Duplio	cate results acceptable?	(Yes) No N/A
MS/M	ISD standards NIST traceable? (Levels D, E)	Yes No (N/A)
MS/M	MSD standards expired? (Levels D, E)	Ye No (V)
Field	duplicate RPD values acceptable?	(Yes) No N/A
Field:	split RPD values acceptable?	Yes No N/
Trans	cription/calculation errors? (Levels D, E)	Yes No N/A
Comn	nents:	
6.	ICP QUALITY CONTROL (Levels D and E)	
ICP s	erial dilution samples analyzed?	Yes No N/A
	erial dilution %D values acceptable?	
	oost digestion spike required?	
	oost digestion spike values acceptable?	
	lards traceable?	
Stand	lards expired?	Yes No N/A
	scription/calculation errors?	
	ments:	\ 1

7.	FURNACE AA QUALITY CONTROL (Levels D and E)		,	
Duplica	ate injections performed as required?	Yes	No	N/A
Duplica	ate injection %RSD values acceptable?	Yes	No	N/A
Analyti	cal spikes performed as required?	Yes	Nd	N/A
Analyti	cal spike recoveries acceptable?	Yes	No	N/A
Standar	rds traceable?	Yes	No	N/A
Standar	rds expired?	Yes	No	N/A
MSA p	erformed as required?	Yes	No	N/A
MSA re	esults acceptable?	Yes	No	N/A
Transci	ription/calculation errors?	Yes	No	N/A
Comme	ents:		$-\!$	_/
				$\stackrel{\smile}{-}$
				
	WOY DANG WANTE (HILL)	6		
8.	HOLDING TIMES (all levels)	\ \var_vad	Νo	NI/A
	es properly preserved?	1 1		N/A
	holding times acceptable?	163	NO	IN/A
Commo	ents:			
		`	*****	
				,
				

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)			
Results reported for all requested analyses?	(Yes	No	N/A
9. RESULT QUANTITATION AND DETECTION LIMITS (all levels) Results reported for all requested analyses? Results supported in the raw data? (Levels D, E)	Yes	No(N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?		No	N/A
Detection limits meet RDL?	Yes	No(N/A
Comments:			

Appendix 6 Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Method Blank - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID:

MB 280-297784/1-A

Analysis Batch: Prep Batch:

280-298187 280-297784

Instrument ID: Lab File ID:

MT_025

Client Matrix: Dilution:

Solid 1.0

Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: 1 g

25B100615.asc

Analysis Date: Prep Date:

10/06/2015 1845 10/05/2015 1350

Leach Date: N/A Final Weight/Volume:

100 mL

Analyte	Result	Qual	MDL	RL	
Antimony	0.38	U	0.38	0.60	you paran
Arsenic	0.66	U	0.66	1.0	
Barium	0.156	В	0.076	0.50	
Beryllium	0.033	U	0.033	0.20	
Boron	0.98	U	0.98	2.0	
Cadmium	0.041	U	0.041	0.20	
Calcium	20.98	₿	14.1	50.0	
Chromium	0.0960	В	0.058	0.20	
Cobalt	0.10	U	0.10	1.0	
Copper	0.22	U.	0.22	1.0	
Lead	0.27	U	0.27	0.50	
Magnesium	6.33	В	3.7	20.0	
Manganese	0.10	Ü	0.10	1.0	
Molybdenum	0.26	Ũ	0.26	2.0	
Nickel	0.126	В	0.12	4.0	
Potassium	41.0	· Ü	41.0	300	
	0.86	Ŭ	0.86	1.0	
Selenium	5.7	Ŭ	5.7	10.0	
Silicon	0.16	·Ŭ	0.16	0,20	
Silver	59.0	Ü	59.0	120	
Sodium	0.094	Ü	0.094	2.0	
Vanadium	0.094	J	0.004		

Method Blank - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID:

MB 280-297784/1-A

10/05/2015 1350

Analysis Batch:

Instrument ID:

MT_025

Client Matrix: Dilution:

Solid

Prep Batch:

280-298379 280-297784

Lab File ID:

25A100715.asc 1 g

Analysis Date:

1.0 10/07/2015 1557

Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: 100 mL Final Weight/Volume:

Prep Date: Leach Date:

N/A

Analyte	Result	Qual	MDL	RL	a specify of the specify of
Aluminum	1.6	U	1.0	0.0	
Iron	8.50		3.8	5.0	
Zinc	0.797	В	0.40	1.0	

Client: Washington Closure Hanford.

Job Number: 280-74906-1

Sdg Number: JP1000

Lab Control Sample - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

LCS 280-297784/2-A Solid

Analysis Batch: Prep Batch:

280-298187 280-297784 Instrument ID: Lab File ID:

MT_025 25B100615.asc

Dilution:

1.0

Leach Batch:

Units:

N/A mg/Kg

Initial Weight/Volume: 1 g

Analysis Date: Prep Date: Leach Date:

10/06/2015 1848 10/05/2015 1350

N/A

Final Weight/Volume:

100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	50.30	101	82 - 110	
Arsenic	100	100.0	100	85 - 110	
Barium	200	214.4	107	87 - 112	
Beryllium	5.00	5.05	101	84 - 114	
Boron	100	100.6	101	80 - 120	
Cadmium	10.0	10.55	105	87 - 110	
Calcium	5000	5205	104	82 - 114	F
Chromium	20.0	20.68	103	84 - 114	
Cobalt	50.0	50.38	101	87 - 110	
Copper	25.0	26.70	107	88 - 110	
Lead	50.0	50.61	101	86 - 110	
Magnesium	5000	4993	100	90 - 110	
Manganese	50.0	50.20	100	88 - 110	
Molybdenum	100	105.6	106	86 - 110	
Nickel	50.0	51.72	103	87 - 110	
Potassium	5000	5282	106	89 - 110	
Selenium	200	195.1	98	83 - 110	
Silicon	1000	188.7	19	10 - 70	
Silver	5.00	5.23	105	87 - 114	
Sodium	5000	5507	110	90 - 112	
Vanadium	50.0	51.44	103	88 - 110	

Lab Control Sample - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

LCS 280-297784/2-A Solid

Analysis Batch: Prep Batch:

280-298379

Instrument ID: Lab File ID:

MT_025 25A100715.asc

Dilution: Analysis Date: 1.0 10/07/2015 1559 10/05/2015 1350 Leach Batch: N/A Units: mg/Kg

280-297784 Initial Weight/Volume:

1 g Final Weight/Volume: 100 mL

Prep Date: Leach Date:

N/A

Analyte .	Spike Amount	Result	% Rec.	Limit
Aluminum	200	198.2	99	82 - 116
Iron	100	111.6	112	87 - 120
Zinc	50.0	51.33	103	76 - 114

Qual

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Matrix Spike - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

280-74906-1

Analysis Batch: Prep Batch:

Units:

280-298187 280-297784

mg/Kg

Instrument ID: Lab File ID:

MT 025

Dilution:

Solid 1.0

Leach Batch:

N/A

Initial Weight/Volume:

25B100615.asc

Analysis Date: Prep Date: Leach Date:

10/06/2015 1858 10/05/2015 1350

N/A

1.193 g Final Weight/Volume: 100 mL

Analyte	Sample R	esult/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	0.38	The access of the second secon	46.4	24.06	52	20 - 200	a produce of an inches of the Strategy of Strategy of
Arsenic	3.5		92.8	83.40	86	76 - 111	
Barium	80.8	*	186	266.5	100	52 - 159	
Beryllium	0.28		4.64	4.36	88	72 - 105	
Boron	1.2	В	92.8	79.93	85	80 - 120	•
Cadmium	0.14	В	9.28	8.62	91	40 - 130	
Calcium	3570		4640	8987	117	43 - 165	
Chromium	9.4		18.6	26.88	94	70 - 200	
Cobalt	8.1		46.4	47.39	85	72 - 106	
Copper	11.3		23.2	32.89	93	37 - 187	
Lead	6.0		46.4	45.98	86	70 - 200.	
Magnesium	4260	`	4640	8688	95	64 - 145	
Manganese	307		46.4	373.5	144	40 - 200	4
Molybdenum	0.26	U	92.8	82.83	89	75 - 103	
Nickel	9.8		46.4	49.50	86	61 - 126	
Potassium	1700		4640	6398	101	56 - 172	
Selenium	0.85	U	186	156.2	84	76 - 104	
Silicon	325		928	473.3	16	20 - 200	N
Silver	0.16	U	4.64	4.25	92	75 - 141	
Sodium	192		4640	4836	100	78 - 111	
Vanadium	51.9		46.4	94.66	92	50 - 169	

Matrix Spike - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

280-74906-1 Solid

Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID: Lab File ID:

MT_025 25A100715.asc

Dilution: Analysis Date: Prep Date:

10/07/2015 1609 10/05/2015 1350 Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: 1.193 g Final Weight/Volume:

100 mL

Leach Date:

N/A

1.0

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	7590	186	10160	1382	50 - 200	4
Iron	20700	92.8	21020	296	70 - 200	4
Zinc	41.8	46.4	83.16	89	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Duplicate - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

280-74906-1 Solid

Analysis Batch: Prep Batch:

280-298187 280-297784 Instrument ID: Lab File ID:

MT 025 25B100615.asc

Dilution: Analysis Date:

1.0 10/06/2015 1855 Leach Batch: Units:

N/A mg/Kg

Initial Weight/Volume: Final Weight/Volume:

1.129 g 100 mL

Prep Date:

10/05/2015 1350

Leach Date: N/A

Analyte	Sample R	esult/Qual	Result	RPD	Limit	Qual
Antimony	0.38	U	0.37	NC	40	U
Arsenic	3.5		3.86	9	30	
Barium	80.8		97.17	18	30	
Beryllium	0.28		0.279	1	30	
Boron	1.2	В	1.20	0.3	30	В
Cadmium	0.14	В	0.121	-12	30	В
Calcium	3570		3552	0.5.	30	
Chromium	9.4		10.06	6	40	
Cobalt	8.1		7.82	3	30	
Copper	11.3		11.12	1	30	
Lead	6.0		6.32	6	40	
Magnesium	4260		4246	0.3	30	
Manganese	307		362.5	17	40	
Molybdenum	0.26	U	0.25	NC	30	U
Nickel	9.8		10.28	4	30	
Potassium	1700		1751	3	40	
Selenium	0.85	U	0.84	NC	30	U
Silicon	325		330.0	1	40	
Silver	0.16	U	0.16	NC	30	U
Sodium	192	Ÿ	194.7	1	30	
Vanadium	51.9		51.33	1	30	

Duplicate - Batch: 280-297784

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

280-74906-1 Solid

10/05/2015 1350

Analysis Batch: Prep Batch:

280-298379 280-297784 Instrument ID: Lab File ID:

MT_025 25A100715.asc

Dilution: Analysis Date: Prep Date:

1.0 10/07/2015 1607

Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: 1.129 g Final Weight/Volume:

100 mL

Leach Date:

N/A

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	7590	7843	3	40	
Iron	20700	20470	1	40	
Zinc	41.8	42.70	2	40	

Date:

19 August 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-326

Subject: Pesticide - Data Package No. JP1000-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1000 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
.I1V846		Soil	С	See note 1
.11\/847	10/1/15	Soil	С	See note 1
J1V848	10/1/15	Soil	С	See note 1

^{1 -} Pesticides by 8081B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for nondetects. If holding times are exceeded by greater than two times the limit, all

associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (49%), all endrin aldehyde results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V846/J1V848) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data Package No. JP1000 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all
 toxaphene results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (49%), all endrin aldehyde results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

PESTICIDE DATA QUALIFICATION SUMMARY*

SDG: JP1000	REVIEWER: ELR	Project: 600-326	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD/LCS analysis
Endrin aldehyde	J	All	MS recovery

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V846

Client: Washington Closure Hanford

Lab Sample ID:

Client Matrix:

Solid

280-74906-1

% Moisture: 9.7 Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

8081A	Organochlorine	Pesticides	(GC)
-------	----------------	------------	------

Analysis Method: Prep Method:

8081A 3550C

1.0

Analysis Batch: Prep Batch:

280-298206 280-297790 Instrument ID: Initial Weight/Volume: 31.6 g Final Weight/Volume:

SGC_C 10 mL

Dilution: Analysis Date:

10/07/2015 1854

Injection Volume: Result Type:

1 uL **PRIMARY**

Prep	Date:	
Analy	/te	

10/04/2015 0934

Analyta	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Analyte	Control of the contro	0.57	UN	0.57	1.8
4,4'-DDD		0.25	UN	0.25	1.8
4,4'-DDE		0.62	UN	0.62	1.8
4,4'-DDT		0.26	U	0.26	1.7
Aldrin		0.22	Ü	0.22	1.7
alpha-BHC		0.70	UN	0.70	1.7
beta-BHC		0.42	UN	0.42	1.7
delta-BHC		0.49	Ü	0.49	1.7
gamma-BHC (Lindane)		0.22	Ū	0.22	1.7
Heptachlor		0.45	Ü	0.45	1.7
Heptachlor epoxide	•	0.18	ŪN	0.18	1.7
Endosulfan I		0.30	UN	0.30	1.8
Endosulfan II		0.29	UN	0.29	1.8
Endosulfan sulfate		0.32	Ü	0.32	1.8
Endrin		0.18	Ū J	0.18	1.8
Endrin aldehyde		0.51	UN	0.51	1.8
Endrin ketone		0.28	UN	0.28	1.8
gamma-Chlordane		0.47	UN	0.47	3.5
Methoxychlor		0.34	UN	0.34	1.8
alpha-Chlordane		0.22	UN	0.22	1.8
Dieldrin		17	\mathcal{L} $^{\circ}$	17	170
Toxaphene		11	" "		
		%Rec	Qualifier	Accept	tance Limits
Surrogate	Park (Del North Martin Calabra (Del Martin) (del Martin) del martine de particular de martin de martin (del mar	75	NAMES OF THE PARTY	59 - 11	5
Tetrachloro-m-xylene		73 72		63 - 12	24
Decachlorobiphenyl		12			•

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V847

Lab Sample ID:

280-74906-2

Client Matrix:

Solid

% Moisture:

11.5

Date Sampled: 10/01/2015 0720

Date Received: 10/02/2015 0935

8081A Organochlorine Pesticides (GC)

Analysis Method: Prep Method:

8081A 3550C Prep Batch:

Analysis Batch: 280-298206

Instrument ID: Initial Weight/Volume: 31.6 g

SGC_C

Dilution: Analysis Date: 1.0

280-297790

Final Weight/Volume: Injection Volume:

10 mL 1 uL

Prep Date:

10/07/2015 1946 10/04/2015 0934

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD	NO THE MAKE THE ACT OF THE WINDOWS THE WAY TO CHARLES A COMPANY AND A COMPANY OF THE WAY OF	0.59	Ü	0.59	1.8
4,4'-DDE		0.59	JY	0.26	1.8
4,4'-DDT		0.63	U	0.63	1.8
Aldrin		0.27	U	0.27	1.8
alpha-BHC		0.23	U	0.23	1.8
beta-BHC		0.71	U	0.71	1.8
delta-BHC		0.43	U	0.43	1.8
gamma-BHC (Lindane)		0.50	U	0.50	1.8
Heptachlor		0.23	Ü	0.23	1.8
Heptachlor epoxide		0.46	U	0.46	1.8
Endosulfan I		0.19	Ü	0.19	1.8
Endosulfan II		0.31	Ü	0.31	1.8
Endosulfan sulfate		0.30	Ü	0.30	1.8
Endosulian sullate Endrin		0.33	Ū _	0.33	1.8
Endrin aldehyde		0.18	υ 1	0.18	1.8
Endrin ketone		0.52	U	0.52	1.8
gamma-Chlordane		0.29	U	0.29	1.8
Methoxychlor		0.48	U	0.48	3.5
		0.35	U	0.35	1.8
alpha-Chlordane Dieldrin	,	0.23	U	0.23	1.8
		17	υT	17	180
Toxaphene		••	4		
Surrogate		%Rec	Qualifier		tance Limits
Tetrachloro-m-xylene	190 a. vig moldock), 1994 v righter. Accordingting messaggiabeterste, generalisk stammer (framstalle stammer	- 67		59 - 17	
Decachlorobiphenyl		71		63 - 12	24

10/17/11

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V848

Lab Sample ID:

280-74906-3

Client Matrix:

Solid

% Moisture: 8.5 Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

8081A Organochlorine Pesticides (GC)

Analysis Method: Prep Method:

8081A 3550C

Prep Batch:

Analysis Batch: 280-298206 280-297790 Instrument ID: Initial Weight/Volume:

SGC_C 30.0 g 10 mL

Dilution: Analysis Date:

Prep Date:

1.0

10/07/2015 2004 10/04/2015 0934 Final Weight/Volume: Injection Volume: Result Type:

1. uL **PRIMARY**

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL	C 1000 110 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4,4'-DDD	entere entre esta presidente como esta esta esta esta entre	0.60	U	0.60	1.9	,
4,4'-DDE		0.26	U	0.26	1.9	
4,4'-DDT		0.64	U	0.64	1.9	
Aldrin		0.27	U	0.27	1.8	
alpha-BHC		0.23	U	0.23	1.8	
beta-BHC		0.73	U	0.73	1.8	
delta-BHC		0.44	Ü	0.44	1.8	
gamma-BHC (Lindane)		0.51	U	0.51	1.8	
Heptachlor	<i>y</i>	0.23	U	0.23	1.8	
Heptachlor epoxide		0.47	U	0.47	1.8	
Endosulfan I		0.19	U	0.19	1.8	
Endosulfan II		0.31	U	0.31	1.9	
Endosulfan sulfate		0.30	U	0.30	1.9	
Endrin		0.33	U	0.33	1.9	
Endrin aldehyde		0.19	\mathcal{T} U	0.19	1.9	
Endrin ketone		0.53	υ	0.53	1.9	
gamma-Chlordane		0.29	U	0.29	1.9	
Methoxychlor		0.49	U	0.49	3.6	
alpha-Chlordane		0.35	U	0.35	1.9	
Dieldrin		0.23	U	0.23	1.9	
Toxaphene		17	υJ	17	180	
Surrogate	ı	%Rec	Qualifier		ance Limits	enservention of the comp
Tetrachloro-m-xylene	a que recepto de Ermanos en constituir son son (30 - 20 - 20 Mario, mente repetituento com mando e mario, sem "Museuph e	77	National Property and Section 1997	59 - 11		
Decachlorobiphenyl		68		63 - 12	4	

16/12/15

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-74906-1

SDG #: JP1000 SAF#: RC-232

Date SDG Closed: October 2, 2015 Data Deliverable: 7 Day / Summary

CLIENT ID J1V846	<u>LAB ID</u> 280-74906-1	ANALYSES REQUESTED 6010/9056M/8310/8081	ANALYSES PERFORMED 6010B/9056M/8310/8081A
J1V847	280-74906-2	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V848	280-74906-3	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V849	280-74906-4	6010	6010B

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 10/2/2015 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

GC SEMIVOLATILES - SW846 8081A - Pesticides

The organic prep laboratory noted that the samples presented in this report required a Florisil clean-up to reduce matrix interferences.

The laboratory noted that the samples presented in this report required a mercury clean-up to reduce matrix interferences caused by sulfur.

The RPD between the primary and confirmation columns exceeded 40% for 4,4'-DDE in sample J1V847. The higher of the two values has been reported. The result has been flagged with a "Y".

The MS/MSD performed on sample J1V846 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limit was exceeded for 4,4'-DDD and 4,4'-DDE. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene and Phenanthrene in sample J1V847. The lower of the two values has been reported, as matrix interference is evident on both columns. The results have been flagged with an "X".

The MS/MSD performed on sample J1V847 exhibited percent recoveries outside the control limits for Chrysene, and the associated sample result has been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Continuing Calibration Verification (CCV) standards associated with samples in analysis batch 280-298048 exhibited %Difference (%D) values >15%, biased high, for Benzo[g,h,i]perylene, Dibenzo[a,h]anthracene and Fluoranthene. The samples associated with these CCVs are either non-detect or less than the reporting limit; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-297784 indicates that physical and chemical interferences are present for Iron and Zinc. Results have been flagged with an "X".

Low levels of Barium, Calcium, Chromium, Magnesium and Nickel are present in the method blank associated with batch 280-297784. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Zinc is present in the method blank associated with batch 280-297784 at 0.797 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 1 mg/kg. TestAmerica's practical quantitation limit (PQL) for Zinc is 3 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1V849, the associated sample amounts are greater than twenty times the method blank concentration.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-297784. As the associated sample amounts are greater than twenty times the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V846; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V846, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, the Sulfate analysis of sample J1V847 had to be performed at a dilution, and the associated result has been flagged with a *D*. The reporting limit has been adjusted relative to the dilution required.

Sulfate is present in the method blank associated with batch 280-297863 at 7.21 mg/kg, which is greater than the project specific reporting limit (PSRL) of 5 mg/kg. TestAmerica's practical quantitation limit (PQL) for Sulfate is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL.

The Matrix Spike performed on sample J1V846 exhibited the percent recovery outside the control limits for Fluoride, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington C	osure Hanfo	ord C	HA	IN OF CUST	ODY/S	SAN	IPLI	E ANA	LYS	IS	REQUE	ST	RC-23	2-102	Page 1 o	xf1
Collector Company Contact Telephone CRAIG, JC Joan Kessner 375-4688								Project Coordinator KESSNER, JH Price Code Data T				Data Tu	naround			
Project Designation Sampling Location 100-IU-2 & 100-IU-6 Remaining Waste Sites 600-326 (Areas 1 and 2) verification							SAF No. RC-232 83 7				700	. ربيد				
Ice Chest No. AFS-04-		Fk	Field Logbook No. COA EL-1667-03 06032				32620	100				Carrier	(Fed)	ξ <u>χ</u>		
Shipped To TestAmerica Denver		Of	ffsite P	roperty No. A131	443						of Lading/Air					
Other Labs Shipped To					Cool <=6C	Conf	<=6C	Cool <=6C	Cool -=	-ec						
1 A TRE 10-1-15			-	Preservation		-	-		G/P							
				Type of Container	G/P	+	G	aG .					280-74906	Chain of Cus	tody	_
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		1	No. of Container(s)	1	<u> </u>	1	1	1				-i -	Г	1	
None			1	Volume	250mL	25	OmL.	250mL	250m	ni.						
Special Handling and/or s	Storage			Sample Analysis	See Item (1) Special Instructions	PAH	s - 6 310	Pesticides - 8081	See kem Speci Instruct	inl						
ס ס				Sample Time	N=22907424-690	e (2)	SHATE SHAP	14.750 10.15	Ph-Early	例题		#3%bd	性的现在分类	30000000000000000000000000000000000000	E-22/5/40	建設高級
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J 8 /846	SOIL	1001	بكِ	0755	-X	+2	×	X			1		-	+-+		
J#4847	SOIL	10/01/	جد	0720	×	12		X	×				+	1		
J 1 ₹848	SOIL	10/01	/15	0755	X	12	-	_			1	***		1		
J1V849	SOIL	10/01	11.	0743	X	+		1		-						
CHAIN OF PO	SSESSION	<u> </u>	****	Sign/Print Names	<u> </u>	ــــــــــــــــــــــــــــــــــــــ	SPEC	IAL INSTRU	JCTIQN	NS						
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ReBinquished By/Removed From	Dent/Time 093	5 Received	By/Stop	nez C. Master d h Date/Time	-		(2) f	anium, Silicon, C Anions - 90 sphate, Sulfat	56 Modif	Soalu fied {	im, Vanadium, Bromide, Chlori	de, Fluc	ride, Nitrogen in	Nitrate, Nitroge	n in Nitrite, Pi	nosphorous in
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FINAL SAMPLE DISPOSAL MEDISPOSITION	thod		Dispo	sed By Date	Time			JP	100							
WCH-EE-011																

Appendix 5 Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	c	D	E
PROJECT:	,00-324		DATA PACKAG	E: JP100	0
VALIDATOR:	ELR	LAB: TAC	•	DATE: [O]	15/15
			SDG:	P 1000	
		ANALYSES	PERFORMED		
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MAT	RIX				
Viv	844 111	U847 J	14848		
300	31"	0 9	,,		
					Soil
Technical verificat	ACKAGE COMPI	present?			Yes No N/A
	MENT PERFORM				Vac No N/A
Initial calibrations	acceptable?	•••••	***************************************		Yes No N/A
					Yes No N/A
					Yes No N/A Yes No N/A
	?acceptable?				
Calculation check	acceptable? reakdowns acceptal	hla9			1 1
	reakdowns accepta				\ \ /
Commonto.					

BLANKS (Levels B, C, D, and E)	
Calibration blanks analyzed? (Levels D, E)	
Calibration blank results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	Yes No N/A
Laboratory blank results acceptable?	Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E)	Yek No N/A
Field/trip blank results acceptable? (Levels C, D, E)	Yes No NA
Transcription/calculation errors? (Levels D, E)	Yes No(N)A
Comments: Vo F	B
4. ACCURACY (Levels C, D, and E)	No N/A
Surrogates analyzed?	X - X
Surrogate recoveries acceptable?	Von No N/A
Surrogates traceable? (Levels D, E)	Yes No (1944)
Surrogates expired? (Levels D, E)	Xes No (N/A)
MS/MSD samples analyzed?	Yes No N/A
MS/MSD results acceptable?	Yet No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A)
MS/MSD standards expired? (Levels D, E)	Yes No NA
LCS/BSS samples analyzed?	No N/A
LCS/BSS results acceptable?	Yes No MA
Standards traceable? (Levels D, E)	Yes No
Standards expired? (Levels D, E)	Yes No N
Transcription/calculation errors? (Levels D, E)	Yes No (N/A)
Performance audit sample(s) analyzed?	Yes (No) N/A
Performance audit sample results acceptable?	Yes No(N)A
Comments:	
Ms-endr- aldehyde (49%)- Jall	
hu tox us modices	no PAS
1-0 (0) () (-C)	

5.	PRECISION (Levels C, D, and E)	
Dupli	icate RPD values acceptable?	Ves No N/A
Dupli	icate results acceptable?	
	SYSTEM PERFORMANCE (Levels D and E) SYSTEM PERFORMANCE (Levels D and E) sitive results acceptable?	
MS/N	MSD standards expired? (Levels D, E) d duplicate RPD values acceptable? d split RPD values acceptable? nscription/calculation errors? (Levels D, E) nments: SYSTEM PERFORMANCE (Levels D and E)	Yes No N/A
Trans	scription/calculation errors? (Levels D, E)	Yes No N/A
Com	ments:	
	no ter us msb - Jall	
6.	SYSTEM PERFORMANCE (Levels D and E)	
Chro	omatographic performance acceptable?	Yes No N/A
Posit	tive results resolved acceptably?	Yes No N/A
Com	ments:	
7.	HOLDING TIMES (all levels)	
	ples properly preserved?	Yes No N/A
	ple holding times acceptable?	
	nments:	
COIL		

Yes	No	XX
Yes	No	N/A/
	No	N/A
Yes	No	N/A
Yes	NoC	N/A
Yes	No	<u>N/A</u>
Yes	No (MA
		_
	/	/ \ \
Yes	No	N/A
Yes	No	N/A
Yes	No	N/A
Yes	Np	N/A
Yes	No	N/A
Yes	Nþ	N/A
	'	<u>_</u>
		
	Yes	Yes No

Appendix 6 Additional Documentation Requested by Client

Quality Control Results

Job Number: 280-74906-1

Sdg Number: JP1000

Method Blank - Batch: 280-297790

Client: Washington Closure Hanford

Method: 8081A Preparation: 3550C

Lab Sample ID: Client Matrix:

MB:280-297790/1-A Solid Analysis Batch: Prep Batch:

280-298206 280-297790 Instrument ID: Lab File ID: SGC_C 10070036.D

Dilution: Analysis Date:

1.0 10/07/2015 2021 10/04/2015 0934 Leach Batch: N/A Units: ug/K

N/A Initial Weight/Volume:
ug/Kg Final Weight/Volume:
Injection Volume:

30.4 g 10 mL 1 uL

Prep Date: Leach Date:

10/04/2

Column ID:

PRIMARY

Analyte	Result	Qual	MDL	RL
4,4'-DDD	0.54	U	0.54	1.7
4,4'-DDE	0.23	U	0.23	1.7
4,4'-DDT	0.58	U	0.58	1.7
Aldrin	0.25	U	0.25	1.6
alpha-BHC	0.21	U	0.21	1.6
beta-BHC	0.66	. U	0.66	1.6
delta-BHC	0.40	U	0.40	1.6
gamma-BHC (Lindane)	0.46	U,	0.46	1.6
Heptachlor	0.21	U	0.21	1.6
Heptachlor epoxide	0.42	U	0.42	1.6
Endosulfan I	0.17	U	0.17	1.6
Endosulfan II	0.28	U	0.28	1.7
Endosulfan sulfate	0.27	U	0.27	1.7
Endrin	0.30	U	0.30	1.7
Endrin aldehyde	0.17	U	0.17	1.7
Endrin ketone	0.48	U	0.48	1.7
gamma-Chlordane	0.26	U	0.26	1.7
Methoxychlor	0.44	U	0.44	3.3
alpha-Chlordane	0.32	U	0.32	1.7
Dieldrin	0.21	Ū	0.21	1.7
Toxaphene	16	U	16	160
Surrogate	% Rec		Acceptance Limits	S
Tetrachloro-m-xylene	77	and the second section of the second section is a second section of the section	59 - 115	
Decachlorobiphenyl	80		63 - 124	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Lab Control Sample - Batch: 280-297790

Method: 8081A Preparation: 3550C

Lab Sample ID: Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	LCS 280-297790/2-A Solid 1.0 10/07/2015 1836 10/04/2015 0934 N/A	Analysis Batch: Prep Batch: Leach Batch: Units:	280-298206 280-297790 N/A ug/Kg	Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Column ID:	SGC_C 10070030.D 32.5 g 10 mL 1 uL PRIMARY
--	---	--	--	--	---

		•			0 1
Analyte	Spike Amount	Result	% Rec.	Limit	Qual
4,4'-DDD	15.4	13.5	88	69 - 126	
4,4'-DDE	15.4	13.3	86	71 - 116	
4,4'-DDT	15.4	14.2	92	67 - 132	·
Aldrin	15.4	12.7	82	69 - 116	
alpha-BHC	15.4	12.8	83	65 - 122	
beta-BHC	15.4	10.2	66	62 - 121	
delta-BHC	15.4	12.6	82	67 - 122	
gamma-BHC (Lindane)	15.4	12.6	82	66 - 120	
Heptachlor	15.4	13.0	85	61 - 126	
Heptachlor epoxide	15.4	13.3	87	71 - 119	
Endosulfan I	15.4	12.0	78	67 - 115	
Endosulfan II	15.4	13.0	84	69 - 120	
Endosulfan sulfate	15.4	13.7	89	69 - 126	
Endrin	15.4	14.0	91	69 - 129	
Endrin aldehyde	15.4	11.8	77	41 - 128	
Endrin ketone	15.4	13.2	86	70 - 125	
gamma-Chlordane	15.4	13.1	85	69 - 122	
Methoxychlor	15.4	14.5	94	65 - 139	
alpha-Chlordane	15.4	13.0	84	71 - 118	
Dieldrin	15.4	13.4	87	71 - 120	
Surrogate	· %	Rec	ŀ	Acceptance Limits	nganganana ayanganan kida ir galabah dalah kidi di
Tetrachloro-m-xylene	ر ۱۳۵۰ ما در ۱۳۵۰ ما در ۱۳۵۰ ما ۱۳۵۰ م در ۱۳۵۱ ما ۱۳۵	76	Marchine and Resident and Company of the Section of	59 - 115	
Decachlorohiphenyl		85		63 - 124	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-297790

Method: 8081A Preparation: 3550C

MS Lab Sample II Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	D: 280-74906-1 Solid 1.0 10/07/2015 1911 10/04/2015 0934 N/A	Analysis Batch: Prep Batch: Leach Batch:	280-298206 280-297790 N/A	Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Column ID:	SGC_C 10070032.D 31.4 g 10 mL 1 uL PRIMARY
MSD Lab Sample	ID: 280-74906-1	Analysis Batch:	280-298206	Instrument ID:	SGC_C
Client Matrix:	Solid	Prep Batch:	280-297790	Lab File ID:	10070033.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30.4 g
Analysis Date:	10/07/2015 1929			Final Weight/Volume:	10 mL
Prep Date:	10/04/2015 0934	·		Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

		Rec.					
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
4,4'-DDD	55	67	69 - 126	22	20	N	N *
4,4'-DDE	65	76	71 - 116	19	15	N	*
4,4'-DDT	66	77	67 - 132	19	29	N	
Aldrin	72	79	69 - 116	13	50		
alpha-BHC	67	75	65 - 122	16	17		
beta-BHC	56	60	62 - 121	11	17	N	N
delta-BHC	65	74	67 - 122	16	19	N	
gamma-BHC (Lindane)	66	75	66 - 120	15	24	•	
Heptachlor	71	81	61 - 126	17	18		
Heptachlor epoxide	72	78	71 - 119	12	18		
Endosulfan I	59	66	67 - 115	14	26	N	N
Endosulfan II	65	74	69 - 120	17	20	N	
Endosulfan sulfate	63	72	69 - 126	16	22	N	
Endrin	70	81	69 - 129	18	30		
Endrin aldehyde	49	55	41 - 128	14	29		
Endrin ketone	63	· 71	70 - 125	15	20	N	
gamma-Chlordane	65	74	69 - 122	16	21	N	
Methoxychlor	62	70	65 - 139	16	23	N	
alpha-Chlordane	62	71	71 - 118	16	18	N	
Dieldrin	65	76	71 - 120	19	25	N	
Surrogate		MS % Rec	MSD ⁴	% Rec	Acc	eptance Lim	its
Tetrachloro-m-xylene	eligelikkisteka (filozofista), sirak kilozofiski tekste ethilere eskilere eskilere eskilere eskilere eskilere	76	74	gen re <u>mandadent er</u> er pres segn retter er teknologie er segn	E	9 - 115	knooper nama cymrunamina enama austriaea ce
Decachlorobiphenyl		68	64		ϵ	3 - 124	

Date:

19 October 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-326

Subject:

Polyaromatic Hydrocarbon - Data Package No. JP1000-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1000 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V846	10/1/15	Soil	С	See note 1
J1V847	10/1/15	Soil	С	See note 1
J1V848	10/1/15	Soil	С	See note 1

^{1 -} Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all

associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR"

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blank was submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V846/J1V848) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

· Completeness

Data package No. JP1000 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The
 data may not be valid for some specific applications (i.e., usable for decisionmaking purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: JP1000	REVIEWER: ELR	Project: 600-326	PAGE_1_OF_1
COMMENTS: No qualifiers a	ssigned		

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V846

Lab Sample ID:

280-74906-1

Client Matrix:

Solid

% Moisture:

Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

8310 PAHs (HPLC)

Analysis Method: 8310 Prep Method:

3550C

1.0

Dilution: Analysis Date:

Prep Date:

10/06/2015 1456

10/04/2015 0938

Analysis Batch: 280-298048 Prep Batch:

280-297792

Instrument ID:

CHHPLC_G Initial Weight/Volume:

30.3 g Final Weight/Volume: Injection Volume:

4 mL 20 uL

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene	The state of the s	. 11	U	11	110
Acenaphthylene		9.9	U	9.9	110
Anthracene		3.3	U	3.3	22
Benzo[a]anthracene		3.5	U	3.5	16
Benzo[a]pyrene		7.0	U	7.0	16
Benzo[b]fluoranthene		4.6	Ū	4.6	16
Benzo[g,h,i]perylene		7.9	V	7.9	33
Benzo[k]fluoranthene		4.3	Ü	4.3	16
Chrysene		5.3	Ū	5.3	44
Dibenzo(a,h)anthracene		12	Ū	12	33
Fluoranthene		14	ŭ	14	44
Fluorene		5.8	Ü	5.8	33
Indeno[1,2,3-cd]pyrene		13	ŭ	13	33
Naphthalene		13	Ü	13	110
Phenanthrene		13	Ū	13	44
Pyrene		13	Ü	13	44
Surrogate		%Rec	Qualifier	Accepta	ance Limits
Terphenyl-d14 (SUR)	keri dan di James dan dikerikan di Kasapan dan dikerikan kasapan di Kasapan dan dan dikerikan dan dikerikan da Kasapan	91		72 - 115	

r politilis

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V847

Lab Sample ID:

280-74906-2

10/04/2015 0938

Client Matrix:

Solid

% Moisture:

11.5

Date Sampled: 10/01/2015 0720

Date Received: 10/02/2015 0935

8310 PAHs (HPLC)

Analysis Method:

8310 3550C

Analysis Batch: 280-298048

Instrument ID:

CHHPLC_G

Prep Method:

Prep Batch:

Initial Weight/Volume:

32.3 g

Dilution:

280-297792

Final Weight/Volume:

Analysis Date: Prep Date:

1.0 10/06/2015 1527

Injection Volume:

4 mL 20 uL

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene	 Hart Shireh Televister in in concentration that the desired the second of the concentration of Control Second S	10	U	10	100
Acenaphthylene .		9.4	U	9.4	100
Anthracene		3.2	Ü	3.2	21
Benzo[a]anthracene		4.0	JX	3.3	16 [.]
Benzo[a]pyrene		21		6.7	16
Benzo[b]fluoranthene		20		4.4	16
Benzo[g,h,i]perylene		7.6	υ	7.6	31
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.1	UN	5.1	42
Dibenzo(a,h)anthracene		12	U	12	31
Fluoranthene		36	Ĵ	14	42
Fluorene		5.5	Ū	5.5	31
ndeno[1,2,3-cd]pyrene		16	j	13	31
Naphthalene		13	Ū	13	100
² henanthrene		17	JX	13	42
Pyrene		13	U	13	42
Surrogate		%Rec	Qualifier	Accenta	ance Limits
Terphenyl-d14 (SUR)	add dawll addann y am Jondon acu Dungard an rainny dirent () hafryd fy'i dd hafryddig saet yr 100 Lleinard acu ar ys be yr	94	× 1 *** ****	72 - 11	

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Client Sample ID:

J1V848

Lab Sample ID:

10/04/2015 0938

Client Matrix:

Solid

280-74906-3

% Moisture: 8.5 Date Sampled: 10/01/2015 0755

Date Received: 10/02/2015 0935

8310 PAHs (HPLC)

Analysis Method: 8310 Prep Method:

3550C

1.0

Analysis Date: Prep Date:

Dilution:

10/06/2015 1658

Analysis Batch: 280-298048 Prep Batch:

280-297792

Instrument ID:

CHHPLC_G Initial Weight/Volume: 31.8 g

Final Weight/Volume: 4 mL 20 uL

Injection Volume: Result Type: **PRIMARY**

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene	na many la 10 late apositive i la ballagant de servici de 1990 10 labora des discultables de 1990 and 19	30	J	10	100
Acenaphthylene	•	9.3	U	9.3	100
Anthracene		3.1	U	3.1	21
Benzo[a]anthracene		3.3	U	3.3	15
Benzo[a]pyrene		6.6	U	6.6	15
Benzo[b]fluoranthene		4.3	U	4.3	15
Benzo[g,h,i]perylene		7.4	U	7.4	31
Benzo[k]fluoranthene		4.1	U	4.1	15
Chrysene		5.0	U	5.0	41
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		13	U ·	13	41
Fluorene		5.4	U	5.4	31
Indeno[1,2,3-cd]pyrene		12	U	12	31
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	41
Pyrene		12	U	℃ 12	41
Surrogate		%Rec	Qualifier	Accepta	ance Limits
Terphenyl-d14 (SUR)	e man i man en en man en men en e	91	n, attalia in relia la ratea (en relia rener aliantes de la marca nel est	72 - 115	

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-74906-1

SDG #: JP1000 SAF#: RC-232

Date SDG Closed: October 2, 2015 Data Deliverable: 7 Day / Summary

CLIENT ID J1V846	<u>LAB ID</u> 280-74906-1	ANALYSES REQUESTED 6010/9056M/8310/8081	ANALYSES PERFORMED 6010B/9056M/8310/8081A
J1V847	280-74906-2	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V848	280-74906-3	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V849	280-74906-4	6010	6010B

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 10/2/2015 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

GC SEMIVOLATILES - SW846 8081A - Pesticides

The organic prep laboratory noted that the samples presented in this report required a Florisil clean-up to reduce matrix interferences.

The laboratory noted that the samples presented in this report required a mercury clean-up to reduce matrix interferences caused by sulfur.

The RPD between the primary and confirmation columns exceeded 40% for 4,4'-DDE in sample J1V847. The higher of the two values has been reported. The result has been flagged with a "Y".

The MS/MSD performed on sample J1V846 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limit was exceeded for 4,4'-DDD and 4,4'-DDE. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene and Phenanthrene in sample J1V847. The lower of the two values has been reported, as matrix interference is evident on both columns. The results have been flagged with an "X".

The MS/MSD performed on sample J1V847 exhibited percent recoveries outside the control limits for Chrysene, and the associated sample result has been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Continuing Calibration Verification (CCV) standards associated with samples in analysis batch 280-298048 exhibited %Difference (%D) values >15%, biased high, for Benzo[g,h,i]perylene, Dibenzo[a,h]anthracene and Fluoranthene. The samples associated with these CCVs are either non-detect or less than the reporting limit; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-297784 indicates that physical and chemical interferences are present for Iron and Zinc. Results have been flagged with an "X".

Low levels of Barium, Calcium, Chromium, Magnesium and Nickel are present in the method blank associated with batch 280-297784. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Zinc is present in the method blank associated with batch 280-297784 at 0.797 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 1 mg/kg. TestAmerica's practical quantitation limit (PQL) for Zinc is 3 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1V849, the associated sample amounts are greater than twenty times the method blank concentration.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-297784. As the associated sample amounts are greater than twenty times the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V846; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V846, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, the Sulfate analysis of sample J1V847 had to be performed at a dilution, and the associated result has been flagged with a "D". The reporting limit has been adjusted relative to the dilution required.

Sulfate is present in the method blank associated with batch 280-297863 at 7.21 mg/kg, which is greater than the project specific reporting limit (PSRL) of 5 mg/kg. TestAmerica's practical quantitation limit (PQL) for Sulfate is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL.

The Matrix Spike performed on sample J1V846 exhibited the percent recovery outside the control limits for Fluoride, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington C	losure Hanf	ord CHA	AIN OF CUST	ODY/S	SAMPL	EANA	LYS	S REQUES	T RC-2	32-102	Page 1 d	of 1
Collector CRAIG, JC		Compa	ny Contact n Kessner	Tel	ephone No. 5-4688	,		Project Coordinator KESSNER, JH	Price Code		Data Tur	maround
Project Designation 100-IU-2 & 100-IU-6 Rema	ining Waste Sites		ng Location -326 (Areas 1 and 2) ve	rHisatlan				SAF No.	7 43	R	21	_
Ice Chest No. AFS - 04		Field Lo	ogbook No. 1667-03		COA 0603262	2000		RC-232 Method of Shipment Commercial Can			700	W _
Shipped To TestAmerica Denve			Property No.	443				Bill of Lading/Air Bill	No.	CX		
Other Labs Shipped To				ľ	1		Γ.					
N A TRE 10-1-1	5		Preservation	Cool <=6C	Cool <∞6C	Cool <=6C	Cool <=6	× ,			1	_
		_	Type of Container	G/P	aG	eG .	G/P					
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		No. of Container(s)	1	1	1	1		280-7490	6 Chain of Cu	ustody	-
None			Volume	250mL	250mL	250mL	250ml.					
Special Handling and/or Cooling as required	Storage		Sample Analysis	See item (1) in Special Instructions	PAHs - 8310	Pesticides - 8081	See item (2 Special Instruction					
Sample No.	Matrix	Sample Date	Sample Time	W-1278-12-150V	rok-vosans sa	1007245AN STREET	OR THE WAY	The state of the s	Maria III Maria Maria	A SECTION CONTRACTOR		GALVION- AT
				STATE OF THE PARTY		200	STATE OF	B 45 5 1 55	医		发展视频	北京国际
J 8 /846	SOIL	10/01/12	0755	IX.	_X_	X	_×_			1		
JR/847	SOIL	10/01/12	0720	×	بع	X	\times			ļ		
J ¶ 848	SOIL	10/01/15	0755	X	7	X	\times				-	
J1V849	SOIL	10/01/14	5 0743	X.	-	-				ļ	\vdash	
CHAIN OF PO	SSESSION		Sign/Print Names	<u>. </u>	SPEC	LIAL INSTRU	JCTIONS			<u> </u>	<u> </u>	
Refinquished By/Removed From I/W (Fig. 1 s.) Refinquished By/Removed/From Marthy Medical Street From Refinquished By/Removed From Refinquished By/Remov	DeterTime 68 08 DeterTime 09 34 Affice 01 115 DeterTime DeterTime DeterTime DeterTime	Received By/Store Received By/Store Received By/Store	d in Date/Time Or 10-1-15 Id in Date/Time (0-1-15 Id in Date/Time (0-1-15 Id in Date/Time (0-1-15 Id in Date/Time (0-1-15 Id in Date/Time	9:35	(1) I Calc Sele (2) I pho	CP Metals - 60 cium, Chromiu prikum, Silicon, C Anions - 904 sphate, Sulfate L T X S + 0	OTOTR (Cic m, Cobalt, Silver, Soc 58 Modified	ose-out List) (Aluminum Copper, Iron, Lead, Ma dium, Vanadium, Zinc) d (Bromide, Chloride, F	gnesium, Mangane	se, Molybdeni Nitrate, Nitrogo	ım, Nickel, Pota	ssium, '
DISPOSITION WCH-EE-011						··						

2.3

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT:	T: 6.00-329		DATA PACKAGE: 171000		
VALIDATOR:	ELR	LAB: TA	(DATE: 10/1	15/15
			SDG: JF	1000	•
		ANALYSES	PERFORMED		
8015	8021	8141	8151	8315	(8310)
		WTPH-HCID	WTPH-G	WTPH-D	
-					
SAMPLES/MAT	RIX:				
311/5	46 111	1847	111848		
			3		

		-		5	oil
			CASE NARRATIV		Yes No N/A
			ON (Levels D and I	•	Ves No N/A
Initial calibrations acceptable? Continuing calibrations acceptable?					1
Standards traceable?					
Standards expired?					1
Calculation check a	acceptable?	***************************************		••••••	Yes No WA
Comments:					

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)				
Calibration blanks analyzed? (Levels D, E)			Yes	No MA
Calibration blank results acceptable? (Levels D, E)				No NA
Laboratory blanks analyzed?		***************	(Yes	No N/A
Laboratory blank results acceptable?				No N/A
Field/trip blanks analyzed? (Levels C, D, E)				
Field/trip blank results acceptable? (Levels C, D, E)			· · · · · · · · · · · · · · · · · · ·	1/ \
Transcription/calculation errors? (Levels D, E)		***************************************	Yes	No (N/A
Comments:	no	FB		
4. ACCURACY (Levels C, D, and E)				
Surrogates/system monitoring compounds analyzed?	••••••	•••••		No N/A
Surrogate/system monitoring compound recoveries acceptable?	••••••		(Yes)	No NZ
Surrogates traceable? (Levels D, E)	•••••••	•••••	Yes	No NA
Surrogates expired? (Levels D, E)		•••••		No N/A
MS/MSD samples analyzed?		•••••	(Yes)	No N/A
MS/MSD results acceptable?	•••••	•••••	(Ye	No N/A
MS/MSD standards NIST traceable? (Levels D, E)		• • • • • • • • • • • • • • • • • • • •	Yes	No N/A
MS/MSD standards expired? (Levels D, E)	••••••	•••••	Yes	No N/A
LCS/BSS samples analyzed?			(Yes	No N/A
LCS/BSS results acceptable?			X 1	No N/A
Standards traceable? (Levels D, E)	*************		Yes	No NA
Standards expired? (Levels D, E)				\ / <i>/</i> \
Transcription/calculation errors? (Levels D, E)				\sim
Performance audit sample(s) analyzed?				/ `
Performance audit sample results acceptable?				1
Comments:				\cup
			NO PA	f

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5.	PRECISION (Levels C, D, and E)	1
Duplica	cate RPD values acceptable?	No N/A
Duplica	cate results acceptable?	es No NA
MS/MS	ISD standards NIST traceable? (Levels D, E)	s No M
MS/MS	ISD standards expired? (Levels D, E)	ع No (N/A)
Field du	duplicate RPD values acceptable?	es) No N/A
Field sp	split RPD values acceptable?Yo	s No MA
Transcr	cription/calculation errors? (Levels D, E)	es No NA
Comme	nents:	
<u></u>		
6.	HOLDING TIMES (all levels)	
Sample	les properly preserved?	es No N/A
Sample	le holding times acceptable?	No N/A
Comme	nents:	

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUAN	FITATION, AND DETECTION LIMITS (all	
levels)		
Results reported for all requested analyses?	(Yes)	No NA
Results supported in the raw data? (Levels D, E)	Yes	No MA
Samples properly prepared? (Levels D, E)		Y T
Detection limits meet RDL?		No N/A
Transcription/calculation errors? (Levels D, E)		NO NA
Comments:		
9. SAMPLE CLEANUP (Levels D and E)		
Fluoricil ® (or other aborbant) cleanup performed?		<i>,</i> , ,
Lot check performed?		1
Check recoveries aceptable?		- 1
Check materials traceable?		•
Check materials Expired?		1
Analytical batch QC given similar cleanup?	Yes	No N/A
Transcription/Calculation Errors?	Yes	No N/A
Comments:		$-\!$

Appendix 6 Additional Documentation Requested by Client

Job Number: 280-74906-1

Sdg Number: JP1000

Method Blank - Batch: 280-297792

Client: Washington Closure Hanford

Method: 8310 Preparation: 3550C

Final Weight/Volume:

Lab Sample ID	:
Client Matrix:	

Dilution:

Solid

MB 280-297792/1-A 1.0

Analysis Batch: Prep Batch: Leach Batch: Units:

280-298048 280-297792 N/A

ug/Kg

Instrument ID: Lab File ID: Initial Weight/Volume:

CHHPLC_G G1006006.D 31.5 g · 4 mL

Analysis Date: 10/06/2015 1355 Prep Date: 10/04/2015 0938

Leach Date:

N/A

Injection Volume: Column ID:

20 uL PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9,5	Ū	9.5	95
Acenaphthylene	8.6	· U	8.6	95
Anthracene	2.9	U	2.9	19
Benzo[a]anthracene	3.0	Ū	3.0	14
Benzo[a]pyrene	6.1	U	6.1	14
Benzo[b]fluoranthene	4.0	U	4.0	14 .
Benzo[g,h,i]perylene	6.9	U	6.9	29
Benzo[k]fluoranthene	3.8	U	3.8	14
Chrysene	4.6	U	4.6	38
Dibenzo(a,h)anthracene	10	U	10	29
Fluoranthene	12	U	12	38
Fluorene	5.0	Ū	5.0	29
Indeno[1,2,3-cd]pyrene	11	Ũ	11	29
Naphthalene	11	Ū	11	95
Phenanthrene	11	U	11	38
Pyrene	11	U	11	38
Surrogate	% Rec		Acceptance Limit	s

Terphenyl-d14 (SUR)

98

72 - 115

Job Number: 280-74906-1

Sdg Number: JP1000

Lab Control Sample - Batch: 280-297792

Client: Washington Closure Hanford

Method: 8310 Preparation: 3550C

Lab Sample ID: Client Matrix: Dilution: Analysis Date: Prep Date:	LCS 280-297792/2-A Solid 1.0 10/06/2015 1426 10/04/2015 0938 N/A	Analysis Batch: Prep Batch: Leach Batch: Units:	280-298048 280-297792 N/A ug/Kg	Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Column ID:	
---	---	--	--	--	--

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1950	1700	87	75 - 116	
Acenaphthylene	. 1950	1660	85	66 - 115	
	1950	1620	83	71 - 115	
Anthracene	1950	1790	92	77 - 120	
Benzo[a]anthracene	1950	1840	94	69 - 115	
Benzo[a]pyrene	1950	1770	91	56 - 115	
Senzo[b]fluoranthene	1950	1970	101	72 - 120	
Benzo[g,h,i]perylene	1950	1830	94	76 - 115	
Benzo[k]fluoranthene	1950	1760	90	79 - 115	
Chrysene	1950	1780	91	72 - 115	
Dibenzo(a,h)anthracene	1950	1740	89	77 - 115	
luoranthene	1950	1740	89	77 - 115	
luorene	1950	1700	87	78 - 115	
ndeno[1,2,3-cd]pyrene	1950	1710	87	68 - 120	
laphthalene		1680	86	75 - 115	
Phenanthrene	1950	1820	93	72 - 115	
Pyrene	1950	1020			
Surrogate	%	Rec	. /	Acceptance Limits	gyggen ag general ar state for the forest
Tombonyl d14 (SHP)	rendered contract in region to provide terroring places allowed in the design and the Constitution of Justice and American India.	14		72 - 115	

Job Number: 280-74906-1

Sdg Number: JP1000

Matrix Spike/

Client: Washington Closure Hanford

Matrix Spike Duplicate Recovery Report - Batch: 280-297792

Method: 8310 Preparation: 3550C

MS Lab Sample II Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	D: 280-74906-2 Solid 1.0 10/06/2015 1557 10/04/2015 0938 N/A	Analysis Batch: Prep Batch: Leach Batch:	280-298048 280-297792 N/A	Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Column ID:	CHHPLC_G G1006010.D 30.6 g 4 mL 20 uL PRIMARY
MSD Lab Sample Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	ID: 280-74906-2 Solid 1.0 10/06/2015 1628 10/04/2015 0938 N/A	Analysis Batch: Prep Batch: Leach Batch:	280-298048 280-297792 N/A	Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Column ID:	CHHPLC_G G1006011.D 30.5 g 4 mL 20 uL PRIMARY

	<u>%</u>	Rec.					
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	86	85	75 - 116	1	20	ra jalijalijari na, njigari jegapena pjeroji nakelende vid ri	approximate and promote section and the first of the firs
Acenaphthylene	85	84	66 - 115	1	20		
Anthracene	89	86	71 - 115	3	20		
Benzo[a]anthracene	95	93	77 - 120	1	20		
Benzo[a]pyrene	86	85	69 - 115	1	20		
Benzo[b]fluoranthene	89	91	56 - 115	2	20		
Benzo[g,h,i]perylene	105	98	72 - 120	7	20		
Benzo[k]fluoranthene	100	99	76 - 1 15	1	20		
Chrysene	315	290	79 - 115	8	20	Ν .	N
Dibenzo(a,h)anthracene	87	93	72 - 115	7	20		
Fluoranthene	91	90	77 - 115	1	20		
Fluorene	90	90	77 - 115	0	20		
Indeno[1,2,3-cd]pyrene	91	88	78 - 115	3	20		
Naphthalene	88	87	68 - 120	2	20		
Phenanthrene	79	81 ·	75 - 115	2	20		
Pyrene	111	104	72 - 115	6	20		
Surrogate		MS % Rec	MSD	% Rec	Acc	eptance Lim	its
Terphenyl-d14 (SUR)	Little and Control of Wilell And his before the control of the con	96	96			72 - 115	

Date:

19 August 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste Site

600-326

Subject:

Wet Chemistry - Data Package No. JP1000-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1000 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V846	10/1/15	Soil	С	See note 1
J1V847	10/1/15	Soil	С	See note 1
J1V848	10/1/15	Soil	С	See note 1

^{1 -} IC anions by 300.0.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for chloride, fluoride, bromide, sulfate; and 48 hours for nitrate, nitrite and orthophosphate.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrate and orthophosphate results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrate and orthophosphate results were qualified as rejected and flagged "UR".

All other holding times were acceptable.

Method Blanks

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

· Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

· Precision

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1V846/J1V848) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package JP1000 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 71%.

MAJOR DEFICIENCIES

The following major deficiencies were noted:

Due to the holding time being exceeded by greater than twice the limit, all
undetected nitrate, nitrate and orthophosphate results were qualified as rejected
and flagged "UR".

Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

 Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrate and orthophosphate results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- Indicates presumptive evidence of a compound at an estimated value. The
 data may not be valid for some specific applications (i.e., usable for decisionmaking purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2 Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP1000	REVIEWER: ELR	Project: 600-326	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate	J	All	Hold time
Nitrite Orthophosphate	UR	All	Hold time

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Analytical Data

Job Number: 280-74906-1

Sdg Number: JP1000

General Chemistry						
Client Sample ID:	J1V846					
Lab Sample ID:	280-74906-1			Date Sampled: 10/01/2015 0755		
Client Matrix:	Solid	% Moisture: 9.7		Date Received: 10/02/2015 0935		
Analyte	Result	Qual Units	MDL RL	Dil Method		
Chloride-Soluble	2.2	U mg/Kg	2.2 5.4	1.0 9056M		
Аг	alysis Batch: 280-297863	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Nitrate as N-Soluble			0.34 2.7	1.0 9056M		
Ar	alysis Batch: 280-297862	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Bromide-Soluble	0,42	_	0.42 2.2	1.0 9056M		
Ar	alysis Batch: 280-297863	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Nitrite as N-Soluble	0.36	U 🔑 mg/Kg	0.36 2.7	′ 1.0 9056 M		
Ar	alysis Batch: 280-297862	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Orthophosphate as I	P-Soluble 1.3	U Q mg/Kg	1.3 5.4	1.0 9056M		
Ar	alysis Batch: 280-297862	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Sulfate-Soluble	43.4		1.8 5.4	1.0 9056 M		
Ar	alysis Batch: 280-297863	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Fluoride-Soluble	0.89	U N mg/Kg	0.89 5.4	1.0 9056 M		
Аг	alysis Batch: 280-297863	Analysis Date: 10/05/2015 1	537	DryWt Corrected: Y		
Analyte	Result	Qual Units	RL RL	Dil Method		
Percent Moisture	9.7	%	0.10 0.2	0 1.0 D-2216		
Ar	alysis Batch: 280-297869	Analysis Date: 10/05/2015 1	018	DryWt Corrected: N		

10/1/11

Client: Washington Closure Hanford

Analytical Data

D-2216

DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-74906-1 Sdg Number: JP1000

		Genera	al Chem	nistry			
Client Sample ID:	J1V847						
Lab Sample ID:	280-74906-2			•	Date	e Sampled: 10/0	1/2015 0720
Client Matrix:	Solid	% Moistu	ıre: 1	1.5	Date	e Received: 10/0)2/2015 0935
Analyte	Result	Qual	Units	MDL	RL	Dil M	ethod
Chloride-Soluble	2.9	B	mg/Kg	2.2	5.6)56M
A	malysis Batch: 280-297863	Analysis Date:	10/05/2	015 1628		•	Corrected: Y
Nitrate as N-Soluble	e 2.8	J	mg/Kg	0.35	2.8		056 M
A	nalysis Batch: 280-297862	Analysis Date:	10/05/2	015 1628		•	Corrected: Y
Bromide-Soluble	0.44	U	mg/Kg	0.44	, 2.2	1.0 90	056M
Д	nalysis Batch: 280-297863	Analysis Date:	10/05/2	015 1628		DryWt	Corrected: Y
Nitrite as N-Soluble	· · · · ·		mg/Kg	0.38	2.8	1.0 90	D56M
Α	analysis Batch: 280-297862			015 1628		DryWt	Corrected: Y
Orthophosphate as		. u Q .		1.4	5.6	1.0 90	056M
	nalysis Batch: 280-297862			015 1628		DryWt	Corrected: Y
Sulfate-Soluble	3470		mg/Kg	9.5	27.9	5.0 90	056M
	nalysis Batch: 280-297863			015 1707		DryWt	Corrected: Y
Fluoride-Soluble	0.92	IJ	mg/Kg	0.92	5.6	1.0 9	056 M
	Analysis Batch: 280-297863	Analysis Date:		• • •		DryWi	Corrected: Y
Analyte	Result	Qual	Units	RL.	RL		lethod

%

11.5

Analysis Batch: 280-297869 Analysis Date: 10/05/2015 1018

0.10

0.10

Percent Moisture

Analytical Data

Job Number: 280-74906-1

Sdg Number: JP1000

		Gener	al Chemis	stry			
Client Sample ID:	J1V848				·		
Lab Sample ID:	280-74906-3				Date	e Sampled:	10/01/2015 0755
Client Matrix:	Solid	% Moist	ure: 8.5		Dat	e Received:	10/02/2015 0935
Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	2.1	U	mg/Kg	2.1	5.3	1.0	9056M
Aı	nalysis Batch: 280-297863	Analysis Date:	10/05/20	15 1645	,	Dr	yWt Corrected: Y
Nitrate as N-Soluble	•	В 🕇	mg/Kg	0.34	2.7	1.0	9056M
A	nalysis Batch: 280-297862			15 1645		Dr	yWt Corrected: Y
Bromide-Soluble	0.42	Ū	mg/Kg	0.42	2.1	1.0	9056M
	nalysis Batch: 280-297863	Analysis Date	10/05/20	15 1645		Dr	yWt Corrected: Y
Nitrite as N-Soluble		ં ૫ જૂ		0.36	2.7	1.0	9056M
A	nalysis Batch: 280-297862			15 1645		Dr	yWt Corrected: Y
Orthophosphate as		∪ 2 _		1.3	5.3	1.0	9056M
	nalysis Batch: 280-297862	Analysis Date	: 10/05/20	15 1645		Dr	yWt Corrected: Y
Sulfate-Soluble	43.4	·	mg/Kg	1.8	5.3	1.0	9056M
	nalysis Batch: 280-29786	Analysis Date	: 10/05/20	15 1645		Dr	yWt Corrected: Y
Fluoride-Soluble	0.88	Ū	mg/Kg	0.88	5.3	1.0	9056M
	nalysis Batch: 280-29786	3 Analysis Date	: 10/05/20	15 1645		Dr	yWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	8.5	Sign of Assessment Company and the State of the Company of the Com	%	0.10	0.10	1.0	.D-2216
	nalysis Batch: 280-297869	Analysis Date	: 10/05/20	15 1018		Dr	yWt Corrected: N

10/17/18

Client: Washington Closure Hanford

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-74906-1

SDG #: JP1000 SAF#: RC-232

Date SDG Closed: October 2, 2015 Data Deliverable: 7 Day / Summary

CLIENT ID J1V846	<u>LAB ID</u> 280-74906-1	ANALYSES REQUESTED 6010/9056M/8310/8081	ANALYSES PERFORMED 6010B/9056M/8310/8081A
J1V847	280-74906-2	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V848	280-74906-3	6010/9056M/8310/8081	6010B/9056M/8310/8081A
J1V849	280-74906-4	6010	6010B

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 10/2/2015 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

GC SEMIVOLATILES - SW846 8081A - Pesticides

The organic prep laboratory noted that the samples presented in this report required a Florisil clean-up to reduce matrix interferences.

The laboratory noted that the samples presented in this report required a mercury clean-up to reduce matrix interferences caused by sulfur.

The RPD between the primary and confirmation columns exceeded 40% for 4,4'-DDE in sample J1V847. The higher of the two values has been reported. The result has been flagged with a "Y".

The MS/MSD performed on sample J1V846 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limit was exceeded for 4,4'-DDD and 4,4'-DDE. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene and Phenanthrene in sample J1V847. The lower of the two values has been reported, as matrix interference is evident on both columns. The results have been flagged with an "X".

The MS/MSD performed on sample J1V847 exhibited percent recoveries outside the control limits for Chrysene, and the associated sample result has been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Continuing Calibration Verification (CCV) standards associated with samples in analysis batch 280-298048 exhibited %Difference (%D) values >15%, biased high, for Benzo[g,h,i]perylene, Dibenzo[a,h]anthracene and Fluoranthene. The samples associated with these CCVs are either non-detect or less than the reporting limit; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-297784 indicates that physical and chemical interferences are present for Iron and Zinc. Results have been flagged with an "X".

Low levels of Barium, Calcium, Chromium, Magnesium and Nickel are present in the method blank associated with batch 280-297784. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Zinc is present in the method blank associated with batch 280-297784 at 0.797 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 1 mg/kg. TestAmerica's practical quantitation limit (PQL) for Zinc is 3 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1V849, the associated sample amounts are greater than twenty times the method blank concentration.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-297784. As the associated sample amounts are greater than twenty times the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V846; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V846, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, the Sulfate analysis of sample J1V847 had to be performed at a dilution, and the associated result has been flagged with a "D". The reporting limit has been adjusted relative to the dilution required.

Sulfate is present in the method blank associated with batch 280-297863 at 7.21 mg/kg, which is greater than the project specific reporting limit (PSRL) of 5 mg/kg. TestAmerica's practical quantitation limit (PQL) for Sulfate is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL.

The Matrix Spike performed on sample J1V846 exhibited the percent recovery outside the control limits for Fluoride, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

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FINAL SAMPLE DIsposal Method Disposed By Dete/Time JPTUUU WCH-EE-011	DISPOSITION	ood	Dispo	osed By Date	/Time		JP	100	<u> </u>					

Appendix 5 Data Validation Supporting Documentation

VALIDATION LEVEL:	Α	В	0	D	E
PROJECT: 6	00-326		DATA PACKAG	E: 171000	, 1
VALIDATOR:	ELR	LAB: TA		DATE: (O	15/15
			SDG:	P1000	•
		ANALYSES I	PERFORMED		
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pН	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MAT	RIX				
\/\v	34c 7/n	16 (79	V848		
					1502
	on documentation j	oresent?	CASE NARRATIV		Yes No N/A
Initial calibrations and Initial calibrations and ICV and CCV check ICV and CCV check Standards traceable Standards expired? Calculation check and ICV and ICV check and ICV and ICV check and ICV che	performed on all insacceptable?	struments?			Yes No N/A Yes No N/A

	3. BLANKS (Levels B, C, D, and E)
3 D, E)Yes No	ICB and CCB checks performed for all applicable analyses? (Levels D,
Yes No(N/A	ICB and CCB results acceptable? (Levels D, E)
	Laboratory blanks analyzed?
(Ye) No N/A	Laboratory blank results acceptable?
Ye(No) N/2	Field blanks analyzed? (Levels C, D, E)
Yes No N	Field blank results acceptable? (Levels C, D, E)
Yes No N/7	Transcription/calculation errors? (Levels D, E)
no HS	Comments:
	· .
No N/A	4. ACCURACY (Levels C, D, and E) Spike samples analyzed?
\sim	Spike recoveries acceptable?
Yes No N/A	Sike standards NIST traceable? (Levels D, E)
\checkmark	Spike standards expired? (Levels D, E)
You No N/	LCS/BSS samples analyzed?
(Yes) No 144	LCS/BSS results acceptable?
Yes No X47	Standards traceable? (Levels D, E)
Yes No N/2	Standards expired? (Levels D, E)
Yes Mo W	Transcription/calculation errors? (Levels D, E)
Yes No N/A	Performance audit sample(s) analyzed?
	Performance audit sample results acceptable?
NO PAY	Comments:
	·

PRECISION (Levels C, D, and E)		
ate RPD values acceptable?	• • • • • • • • • • • • • • • • • • • •	No N/A
		, — 1
HOLDING TIMES (all levels)		
es properly preserved?	***************************************	Ye No N/A
e holding times acceptable?		Yes (No) N/A
ients: Ontho, number hierie - >2x	c 3/0K	
	_	
	Atte RPD values acceptable?	ate results acceptable?

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	Yes No NA
Results supported in the raw data? (Levels D, E)	Yes No NA
Samples properly prepared? (Levels D, E) Detection limits meet RDL?	Yes No N/A
Detection limits meet RDL?	(Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments:	

Appendix 6 Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Method Blank - Batch: 280-297862

Method: 9056M Preparation: N/A

Lab Sample ID:

MB 280-297896/2-A

Analysis Batch:

280-297862

Instrument ID:

WC_lonChrom8

Client Matrix:

Solid

Prep Batch:

N/A

Lab File ID:

15.0000.d

Dilution: Analysis Date: 1.0 10/05/2015 1724 Leach Batch:

Units:

280-297896 mg/Kg

Initial Weight/Volume: Final Weight/Volume:

5 mL

5 mL

Prep Date:

Analyte

N/A

Leach Date:

Orthophosphate as P-Soluble

Nitrate as N-Soluble Nitrite as N-Soluble

10/05/2015 1321

Result	Qual	MDL	RL.	
0.31	U	0.31	2.5	
0.34	Ũ	0.34	2.5	
1.2	U	1.2	5.0	

Method Reporting Limit Check - Batch: 280-297862

Method: 9056M Preparation: N/A

Lab Sample ID:

MRL 280-297862/3

Analysis Batch:

280-297862

Instrument ID:

% Rec.

96

85

63

WC_lonChrom8

Qual

В

В

U

Qual

Client Matrix: Dilution:

Water 1.0

10/05/2015 1254

Prep Batch: Leach Batch: Units:

Spike Amount

0.200

0.200

N/A N/A

Result

0.193

0.171

0.19

Lab File ID:

03.0000.d

Analysis Date: Prep Date:

Leach Date:

Nitrate as N-Soluble

Nitrite as N-Soluble

Analyte

N/A N/A

mg/L

Initial Weight/Volume: Final Weight/Volume:

5 mL 5 mL

Limit

50 - 150

50 - 150

50 - 150

0.200 Orthophosphate as P-Soluble Lab Control Sample - Batch: 280-297862

Method: 9056M Preparation: N/A

Lab Sample ID:

LCS 280-297896/1-A

Analysis Batch:

280-297862

Instrument ID:

WC_lonChrom8

Client Matrix: Dilution:

Solid 1.0

Prep Batch: Leach Batch:

Units:

N/A 280-297896

mg/Kg

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

07.0000.d 5 mL 5 mL

Analysis Date: Prep Date: Leach Date:

N/A

10/05/2015 1321

10/05/2015 1504

Analyte	Spike Amount	Result	% Rec.	Limit
Nitrate as N-Soluble	50.0	49.94	100	90 - 110
Nitrite as N-Soluble	50.0	49.86	100	90 - 110
Orthophosphate as P-Soluble	50.0	50.10	100	90 - 110

Client: Washington Closure Hanford

Job Number: 280-74906-1

Sdg Number: JP1000

Matrix Spike - Batch: 280-297862

Method: 9056M Preparation: N/A

Lab S	ample	ID:
Client	Matrix	C.

280-74906-1

Solid

1.0

Analysis Date: Prep Date:

Dilution:

Leach Date:

10/05/2015 1611 N/A

10/05/2015 1321

Units:

Analysis Batch: 280-297862 Prep Batch: N/A

Leach Batch:

280-297896 mg/Kg

Instrument ID:

WC_IonChrom8 Lab File ID: 11.0000.d

Initial Weight/Volume: Final Weight/Volume:

5 mL 5 mL

25 uL

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.71	В	54.4	56.97	103	80 - 120	rough, manner y man a
Nitrite as N-Soluble	0.36	U	54.4	55.07	101	80 - 120	
Orthophosphate as P-Soluble	1.3	U	54.4	49.43	91	80 - 120	

Duplicate - Batch: 280-297862

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

Analysis Date:

Prep Date:

Leach Date:

Dilution:

280-74906-1 Solid

1.0 10/05/2015 1554

N/A

10/05/2015 1321

Analysis Batch: 280-297862

Prep Batch: Leach Batch: 280-297896 Units: mg/Kg

Instrument ID:

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

WC_lonChrom8 10.0000.d 5 mL 5 mL

25 uL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate as N-Soluble	0.71	В	0.718	0.4	15	В
Nitrite as N-Soluble	0.36	U	0.37	NC	15	U
Orthophosphate as P-Soluble	1.3	U	1.4	NC	15	U

Job Number: 280-74906-1 Client: Washington Closure Hanford

Sdg Number: JP1000

Method Blank - Batch: 280-297863 Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

MB 280-297896/2-A Solid

Analysis Batch: Prep Batch:

280-297863 N/A

Instrument ID: Lab File ID:

WC_lonChrom8

Dilution: Analysis Date: 1.0 10/05/2015 1724 Leach Batch:

Units:

280-297896

Initial Weight/Volume:

15.0000.d

Prep Date:

N/A

mg/Kg

Final Weight/Volume:

5 mL 5 mL

Leach Date: 10/05/2015 1321

Analyte	Result	Qual	MDL	RL
Chloride-Soluble	2.0	U	2.0	5.0
Bromide-Soluble	0.39	U	0.39	2.0
Sulfate-Soluble	7.21	•	1.7	5.0
Fluoride-Soluble	0.82	U	0.82	5.0

Method Reporting Limit Check - Batch: 280-297863

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix: Dilution:

MRL 280-297863/3 Water

Analysis Batch: Prep Batch: Leach Batch:

280-297863 N/A N/A

Instrument ID: Lab File ID:

WC_lonChrom8 03.0000.d

Analysis Date: Prep Date: Leach Date:

1.0 10/05/2015 1254 N/A

Units: mg/L

Initial Weight/Volume: 5 mL Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	2.50	2.49	99	50 - 150	В
Bromide-Soluble	0.200	0.212	106	50 - 150	
Sulfate-Soluble	2.50	2.49	99	50 - 150	. В
Fluoride-Soluble	0.200	0.175	87	50 - 150	В

Lab Control Sample - Batch: 280-297863

N/A

Method: 9056M Preparation: N/A

Lab Sample ID: Client Matrix:

LCS 280-297896/1-A Solid

Analysis Batch: Prep Batch:

Units:

280-297863 N/A

Instrument ID: Lab File ID:

WC IonChrom8 07.0000.d

Dilution: Analysis Date: Prep Date:

1.0 10/05/2015 1504 N/A

Leach Date:

10/05/2015 1321

Leach Batch: 280-297896 Initial Weight/Volume: 5 mL Final Weight/Volume: mg/Kg 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	1000	1035	104	90 - 110	AND THE PERSON OF THE PERSON O
Bromide-Soluble	50.0	48.67	97	90 - 110	
Sulfate-Soluble	1000	1006	101	90 - 110	
Fluoride-Soluble	50.0	49.58	99	90 - 110	